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TITLE: SYSTEM AND METHOD FOR ACCESSING A MESSAGING SERVICE USING A SHORT DIALING SEQUENCE

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SYSTEM AND METHOD FOR ACCESSING A MESSAGING SERVICE USING A SHORT DIALING SEQUENCE

BACKGROUND

A. Field of the Invention

The present invention relates to telecommunications services, and more particularly to a method and system for efficiently accessing messaging services.

B. Description of Related Art and Advantages of the Invention

Telephone answering devices (TAD) such as message answering machines have become a popular way for users of telephone subscribers to retrieve messages left by callers who have called while no one was available to answer the telephone. Once the message answering machine is setup, its easy to use. By pressing a button, a user can play any messages left by callers.

The problem with such a TAD is that callers are not able to leave messages while another caller is already leaving a message. In addition, callers cannot leave messages while the subscriber is using the telephone. The caller receives a busy signal unless the called party subscribes to a "call-waiting" service. If the called party subscribes to a call-waiting service and is on the telephone when another call comes in, the caller would get a ring. The TAD, however, is still not able to record a message. The TAD may therefore be inadequate for recording messages particularly in business environments in which a subscriber may receive a large number of telephone calls.

Alternatives TAD are available in most office environments. A popular alternative is a voice mail system allowing subscribers to receive messages in voice mailboxes. Voice mail systems allow subscribers to receive, edit and forward messages to one or more mailboxes within the voice mail system.

Voice mail systems are available as stand-alone or integrated systems. Stand-alone systems are similar to answering machines except that the voice mailboxes communicate with one another to make it possible to forward messages from one voice mailbox to another. Integrated voice mail systems typically connect a caller to the called party's mailbox after a certain number of rings. Integrated voice mail systems are preferred because they can provide the capability of receiving messages while the phone is being used, or even while another caller is leaving a message.

Initially, voice mail systems were implemented in private branch exchanges (PBX) or other telephone systems local to the users. Telecommunications service providers also offer messaging services or the capability of making third-party messaging services available to its subscribers. The subscribers may subscribe to the voice mail service and receive a special telephone number for accessing the customer mailbox. Early messaging services were typically implemented in local switches. Some providers use a voice messaging platform supplied by the telecommunications provider or by a third-party to offer messaging services. The voice-messaging platform contains voice mailboxes to which callers are connected when a called telephone number goes unanswered. The voice-messaging platform is also accessible to subscribers via the telephone number for voice mail. The user may access the voice mailbox to which it is assigned from any telephone in the network.

The advantage of using the messaging services provided by telecommunications service providers is that it makes voice mail available to all customers and not just to organizations or businesses having a local voice mail system. Furthermore, the voice mail system provided by the telecommunications service providers will connect a caller to a voice mailbox even when the telephone is being used.

One problem with the voice mail system provided by service providers is that a user must dial either a 7 or 10 digit telephone number to access and retrieve messages. This is inconvenient to customers who would prefer the ease of simply pressing one button on the answering machine.

It would be desirable to provide a voice mail service that will permit the customer to access messages with a dialing sequence that is shorter than a full telephone number.

Some switch-based voice mail systems permit a customer to access messages using a two or three digit sequence. Switch-based systems, however, are not practical in a multi-vendor telephone network. Telephone switches in the United States and other multi-vendor networks must provide access to different service providers.

It would be desirable to provide a voice mail service that is not switch-based and that permits access to mailboxes using a short dialing sequence.

BRIEF DESCRIPTION OF THE DRAWINGS

Presently preferred embodiments of the invention are described below in conjunction with the appended drawing figures, wherein like reference numerals refer to like elements in the various figures, and wherein:

FIG. 1 is a block diagram of a voice mail system in a telecommunications network in which the present invention finds particular use;

FIG. 2 is a block diagram of a preferred embodiment of the present invention; and

FIGs. 3A and 3B show a flow chart of a preferred embodiment of a described process for accessing messaging services.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 is a block diagram of a messaging system **5** in a telecommunications network according to an aspect of the present invention. The messaging system **5** includes a first and second customer premises equipment (CPE) **10a-b**, a first, second and third central office switch **20a-c**, a supplementary service database **50**, and a messaging services platform **80**. The message system **5** in FIG. 1 implements messaging services, such as voice mail services, for any subscriber or user connected to the telecommunications network through a telecommunications device, such as, for example, the CPE's **10a-b**. The messaging services system **5** advantageously provides access to messaging services using a short dialing or messaging sequence while permitting the use of switches **20** provided by different vendors. A short dialing sequence may include any sequence of *n* characters and digits where *n* is less than 7.

The star-code access service permits the user to access voice mail by pressing the *(star key) and any selected sequence of digits fewer than six. For example, a two digit sequence following the * (star key), *i.e.* *XX, may be dialed from the user's CPE **10** to access voice mail. In a preferred embodiment, a user may subscribe to the star-code access service in addition to or in conjunction with a messaging service, such as voice mail. Alternatively, a user may obtain the star-code access service with the messaging service.

The CPE's **10a-b** are typically telephones having a keypad that is capable of generating dual-tone multiple frequency (DTMF) tones for dialing and signaling. The CPE **10a** is one of many CPEs that access the telecommunications network via the first central office switch **20a**. Users of telephone service providers have CPEs **10a-b** with telephone numbers **A** and **B** assigned to them. The CPE **10a** connects to the first central office switch **20a** using a circuit at connection **11** the details of which are

known by those skilled in the art. The central office switch **20a** to which the CPE **10a** is connected may identify the CPE by the telephone number at **A**.

The central office switch **20a** switches calls to and from the CPE **10a** and other telecommunications devices to which it is connected. The central office switch **20a** may also be provisioned to perform other services as is well known in the art. When the user at CPE **10a** lifts the telephone set off the hook, or otherwise closes the circuit at connection **11** and begins to dial a destination telephone number, the central office switch **20a** identifies the telephone number **A** of the CPE **10a** and analyzes the destination telephone number. If the destination telephone number is one that initiates one of the services for which the central office switch **20a** is provisioned, the steps for performing the service are started. Otherwise, the central office switch **20a** routes the call to the destination telephone number. In a preferred embodiment, the central office switch **20a** uses a signal transfer point (STP) to route calls. Switches that may be used for the central office switches **20a-c** include the 5ESS7 made by Lucent and the DMS-100 made by Northern Telecom.

The central office switch **20a** is connected to all other switches in the system via voice and signal trunk lines such as trunk lines **12, 14, 16**.

The central office switch **20a** is connected to the supplementary service database **50a** by connection **13**. The supplementary service database **50a** may be any database used by a service provider suitable for configuring and controlling the services to which users subscribe. For example, the user with the CPE **10a** having telephone number **A** may subscribe to supplementary services such as call forwarding, caller ID or voice mail. The supplementary service database **20a** includes a customer record identifying these services as those subscribed to by the user with telephone

number A. In a preferred embodiment, the supplementary service database **50a** includes the advanced intelligent network service control point (AIN SCP).

In a preferred embodiment, the central office switches **a-c** and the supplementary service database **50a-b** operate according to the Signaling System #7 (SS7) protocol.

Messaging services platform **80** can be accessed from anywhere on the network using a call forwarding number **60**. The messaging services platform **80** connects to the system via a data path **19** and a voice path **18**. In a preferred embodiment, the messaging services platform **80** uses voice lines organized as a hunt group. For a data path, the messaging services platform **80** preferably uses a Signal Message Desk Interface (SMDI) circuit. Hunt groups and SMDI circuits are known in the art and require no further description. The messaging services platform **80** includes the mailboxes and other resources needed to perform, or to access the services needed to perform messaging services.

The operation of the messaging services performed by the messaging services platform **80** may depend on the service selected by the user. For example, a voice mail service may be provisioned in the central office switch **20a** to connect the second user at CPE **10b** to the mailbox of the first user at CPE **10a** when no one answers the second user's call at the CPE **10a**. The second user may leave the first user a message. To retrieve the message from a telecommunications device other than the CPE **10a**, the user dials the call forwarding number **60** and, once connected, may enter a password, or some other personal identification number, to gain access to the mailbox. Typically, the user would have to dial the call forwarding number **60** from the CPE **10a** to retrieve his messages. The advantage of the present invention is that,

from the CPE **10a**, the user need only dial a short dialing sequence, such as *XX, to retrieve messages from his mailbox.

FIG. 2 shows software and data structure in the system of FIG. 1 for providing a short dialing sequence access to messaging services. The central office switch **20a** in FIG. 2 includes a router 22, a caller identifier **24**, a supplementary service processor **30**, and an error handler **32**. In a preferred embodiment, the user uses a star code with two digits, "*XX," to access voice mail. Preferably, the user is required to subscribe to the star code access service.

The router **22** performs signaling functions for routing calls to and from the CPE **10**. In a preferred embodiment, the router **22** is a signal transfer point (STP) that uses SS7 signaling.

The supplementary service processor **30** analyzes dialing sequences from the CPE **10** to determine whether access to a supplementary service for which the switch has been provisioned is being accessed. If a supplementary service is identified, the supplementary service processor **30** suspends call processing and initiates the service identified by the dialing sequence. The supplementary service processor **30** may require instruction from the supplementary service database **50**. If instructions are required, the supplementary service processor **30** uses a caller identifier **24** to query the supplementary service database **50** to obtain instructions on how to initiate the service requested by the caller. In a preferred embodiment, the supplementary service processor **30** is an AIN SSP (service switching point). The AIN SSP **30** detects the star code access sequence as a public office dialing plan (PODP) trigger.

The error handler **32** may be invoked by the supplementary service processor **30** to handle errors associated with using supplementary services. For example, if a caller tries to use a service for which the caller has no subscription, the error handler is

used to provide the proper feedback. The caller may dial a sequence that is identified by the supplementary service processor **30**. To initiate service, the supplementary service processor **30** queries the supplementary service database **50** and, determines that the caller does not subscribe to the service requested. The supplementary service processor **30** will request that the error handler **32** send, for example, a recorded message notifying the caller that the attempted access to the service was not permitted.

The supplementary service database **50** includes at least one services code **51**, a redirecting information record **53**, a subscriber counter **55**, a plurality of customer records **52**, and a routing table **62**.

The customer records **52** are data base records for the users that are connected to the central office switch **20**. In a preferred embodiment, the customer records **52** include a customer identifier **54**, an optional star code access service indicator **56**, an optional voice mail service indicator **58**, and a call forwarding number **60**.

The services codes **51** may be used to determine if supplementary services are supported in a service area that access the supplementary services database **50**. The supplementary services indicated by the services code **51** may include the star code access service. The star code access service may be processed by detecting the service, and then determining if the calling party subscribes to the service. In a preferred embodiment, the service code **51** includes the AIN vertical services code system to indicate whether the services to which any customer may subscribe include the star code access service.

If, during a query, the service code **51** indicates that the star code access service is available, the calling party number is used to determine if the caller subscribes to the star code access service.

The redirecting information record **53** may be used to shut down the star code access service at any time. The subscriber counter **55** may be used to count the number of times the service is accessed.

The customer identifier **54** may include any type of data element that identifies the customer. For example, the customer identifier **54** may include the name, social security number, customer identification number, telephone number or other any other suitable type of identification. The customer identifier **54** preferably includes the customer's telephone number.

The optional star code access service indicator **56** identifies whether the customer subscribes to the star code access service. The customer may subscribe to a variety of different services such as call forwarding, three-way calling, caller ID, etc. The optional voice mail service indicator **58** identifies whether the customer subscribes to a voice mail service and may include information that would provide instructions on the use of the voice mail service. For example, a password may be required, or other special steps may be necessary to use the service. The instructions may be provided to the switch **20** if any special processing is required of the switch **20**. The optional star code access service indicator **56** and voice mail service indicator **58** are used in an alternative embodiment in which the supplementary services database **50** determines the calling party's records are accessed before determining the services to which the party subscribes.

The call forwarding number **60** is a number that the customer uses to access voice mail. The call forwarding number **60** is typically a 7 or 10 digit telephone number that a customer could use to dial in for voice mail messages from any telecommunications device. The call forwarding numbers **60** are preferably

maintained in a routing table **62**. In a preferred embodiment, the calling party's identifier is used to retrieve a call forwarding number from the routing table **62**.

The customer records **52** in the supplementary service database **50** are preferably entered during normal customer service processing through a data entry system. For example, when a new customer orders service, a new customer record **52** is created using a menu or form driven user interface. The user interface may be located at any office of the service provider and have the ability to process customer records at any supplementary service database **50** in the provider's network. In a preferred embodiment, the supplementary service database includes the AIN service control point (SCP).

In a preferred embodiment, the central office switch **20a** is provisioned for the star code access service. When the supplementary service processor **30** detects the selected sequence (for example, '*98'), the supplementary service processor **30** queries the supplementary services database **50** to determine whether the customer subscribes to the short dialing sequence access to voice mail service at connection **30**. The query that is sent by the supplementary service processor **30** preferably includes the caller identifier **24**. The supplementary services database **50** determines whether the star code access service is offered in the service area and then determines whether the calling party identified by the caller identifier **24** is a subscriber to the service. Alternatively, the supplementary service database **50** may search a plurality of customer records **52** for the customer record **52** that matches the caller identifier **24**.

If the supplementary service database **50** finds that the caller subscribes to the star code access service, it forwards the call forwarding number for the service to the central office switch **20**. The router **22** in the central office switch **20** uses the call

forwarding number to connect the customer to the messaging services platform **80**. Once connected, the messaging service platform **80** performs the necessary steps to enable the customer to access voice mail. The steps may include requesting and processing a password or other access code.

FIGs. 3A-B show a flow chart that describes a method of accessing messaging services using a star code access code. The method described in FIGs. 3A-B are preferably performed using the messaging services system described in FIG. 2 in which the supplementary services processor **50** includes the AIN SCP; the supplementary service processor **30** is an SSP and the router **22** is an STP.

The flow charts in FIGs. 3A and 3B are methods that are preferably performed by the central office switch **20a** when the customer at CPE **10a** uses the star code access service. The method begins when the customer places the CPE **10a** off-hook at step **102**. When the dial tone is present at step **104**, the customer dials the sequence of digits selected by the service provider as the star code access code (*e.g.* *98). The SSP receives the dialed digits at step **106** and encounters a PODP trigger at step **108**.

In response to the PODP trigger, the SSP connects to the SCP for instructions. At step **110**, the SCP analyzes the sequence that caused the PODP trigger (*i.e.* *98) and the caller's number to determine if the caller subscribes to the star code access service. The SCP analyzes the information according to the method described by the flow chart in FIG. 3B.

As shown in FIG. 3B, the SCP begins a database query at step **130**. As discussed with reference to FIG. 2, the SCP may be queried by analyzing the service code **51** to determine if the star code access service is offered to the customers that are connected to the central office switch **20**. The customer records for customers that use the star code access service are then analyzed to determine of the caller subscribes to

the service. One of ordinary skill in the art will understand how to modify the flow charts in FIG. 3B to perform alternative embodiments, such as one in which the customer records **52** are analyzed to determine whether the star code access service is one of the services to which caller subscribes.

The SCP analyzes the sequence that caused the PODP trigger to determine if a vertical services code (VSC) is present at decision block **132**. In a preferred embodiment, the SCP checks the service code **51** for a vertical services code. If no vertical services code is present, an error is processed at an error handler at step **154**. An error message may be set at step **154** and sent to the central office switch **20** at step **156**. The message may be linked to, or may include a recorded message that the central office switch **20** may send to the CPE **10**.

If at step **132**, the vertical services code is detected, it is checked to determine if it includes the star code access service at decision block **134**. If the star code access service is not indicated, the SCP returns a "No subscription" message back to the SSP in the central office switch **20** at step **152**.

If at step **134**, the vertical services code includes the star access service, the subscriber counter **55** is incremented at step **136**. If redirection information **53** is present, an error is processed at step **154**.

At decision block **140**, the query that is sent by the SSP in the central office switch **20** is checked to determine if it includes a caller identifier **24**. In a preferred embodiment, the caller identifier **24** is the calling party identification, which is typically the caller's telephone number. If the query did not include the caller identification **24**, an error condition is processed at step **154**.

At step **142**, the caller identifier **24** is used to retrieve a call forwarding number **60**, or a "forward to number (#)." The call forwarding numbers are stored in a routing table **62**. At decision block **144**, if no record of a call forwarding number is found for the caller identifier **24**, an error condition is processed at step **154**. If a record is found, it is checked to determine if it contains a NULL at decision block **146**. If a NULL is found, control is transferred to the error handler at step **154**. At decision block **148**, the call forwarding number is checked to see if it is the same as the caller identifier **24**. If the call forwarding number is the same as the caller identifier **24**, an error condition is processed at step **154**. If a NULL or the caller identifier **24** is retrieved from the routing table **62**, it may indicate a variety of status conditions. For example, it may indicate that the customer recently cancelled a star code access service, or that the customer recently cancelled the messaging service, or is in the process of switching messaging services.

If the messaging service call forwarding number is found in the routing table **62**, a data element that may have been sent in the query from the SSP, such as a called party identifier, may be set to the call forwarding number at step **150**. The call forwarding number is sent to the SSP as the analyzed route at step **158**.

Referring back to FIG. 3A, a subscription is found at decision block **112** when the analyzed route returns from step **158** with a call forwarding number. When an error is detected at step **110**, no subscription was found. Error conditions are sent to the error handler at step **114**. The error handler preferably processes the error by announcing the error to the caller at step **116** by playing for example, a recorded error message.

If a subscription is found at decision block **112**, the SSP sends the call forwarding number to the STP. The STP routes the call to the messaging service at step **120**.

While the invention has been described in conjunction with presently preferred embodiments of the invention, persons of skill in the art will appreciate that variations may be made without departure from the scope and spirit of the invention. This true scope and spirit is defined by the appended claims, interpreted in light of the foregoing.